PROCEDURE 13 - Indoor Air Quality

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Synopsis

This procedure identifies health hazards associated with poor indoor air quality and provide guidelines to reduce potential exposure to these hazards. This procedure applies to all NWS facilities, work locations, and employees.

Initial Implementation Requirements:

- **Analyze Site Operations versus Requirements of the Procedure**
  - Perform Indoor Air Quality Investigation to address employees' complaints (If applicable). *(13.3.8)*
- **Develop/Obtain/Provide Documentation/Information required for Site**
  - Inform personnel about painting, renovations and other activities that may affect the Air Quality *(13.3.1f.3)*
- **Designate Person to Administer the Indoor Air Quality Procedure Requirements**
- **Provide Local Training of Site Personnel (if applicable)**
- **Designate Person for Contractor Oversight (If applicable)**
- **Inventory Material/Equipment (Procure as required)**
  - HVAC filters *(13.3.7)*

Recurring and Annual Task Requirements:

- **Perform Inspection/Assessment/Testing**
  - Maintain HVAC systems per manufacturer's recommendations *(13.3.7)*
  - Conduct semi-annual inspections of HVAC systems for compliance with American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE). *(13.3.3)*
- **Review/Update Documentation**
  - Maintain records of indoor air quality complaints, investigations, and corrective actions *(13.3.8)*
- **Provide Refresher Training of Site Personnel (As required)**
- **Inspect/Replace/Recalibrate Maintain Material/Equipment**
  - HVAC filters *(13.3.7)*

Indoor Air Quality Checklist

Requirements	EHB 15 Reference	YES	NO	N/A	Comments
Is initial and annual review of this procedure conducted and documented?	13.4.2				
Have the facility's Heating, Ventilation and Air Conditioning (HVAC) systems been checked semi-annually for compliance with this procedure?	13.3.3				
Has the facility established a preventative maintenance schedule for the HVAC system?	13.3.3				
Is the facility, free of areas of microbial growth, particularly the HVAC drip pans, drop ceiling panels, carpeting, etc.?	13.3.4				
Is the relative humidity maintained between 30% and 60% in the facility?	13.3.4				
Is the carbon dioxide level in the facility below 1000 parts per million?	13.3.3				
Are HVAC systems designed to properly distribute air throughout the workspace?	13.3.5				
Are HVAC air intakes located to minimize the entrance of contaminants (from sources such as industrial areas or parking lots) into the workplace?	13.3.6				
Are all HVAC drip pans equipped with gravity drains?	13.3.4				

Have any employee been exposed to any regulated contaminant in excess of OSHA permissible exposure limits or ACGIH threshold limit values?	13.3.9				
Have all indoor air quality concerns been investigated and documented?	13.3.8				

13 INDOOR AIR QUALITY

13.1 Purpose And Scope

As part of its goal to provide a safe and healthful workplace, the National Weather Service (NWS) is implementing this procedure related to hazards associated with poor indoor air quality. This procedure applies to all NWS facilities, work locations, and employees.

13.2 Definitions

ACGIH. American Conference of Governmental Industrial Hygienists.

ASHRAE. American Society of Heating, Refrigeration, and Air Conditioning Engineers.

CFR. Code of Federal Regulations.

Field Office. A Field Office may include the following: Weather Forecast Office (WFO), River Forecast Center (RFC), Weather Service Office (WSO), and a Data Collection Office (DCO).

EPA. United States Environmental Protection Agency.

Operating Unit. For the purpose of this procedure, Operating Unit includes the National Centers for Environmental Prediction (NCEP), National Data Buoy Center (NDBC), NWS Training Center (NWSTC), National Reconditioning Center (NRC), Radar Operations Center (ROC), or the Sterling Research & Development Center (SR&DC).

OSHA. Occupational Safety and Health Administration.

Station Manager. For the purpose of this procedure, the Station Manager shall be either the NWS Regional Director; Directors of Centers under NCEP (Aviation Weather Center, NP6; Storm Prediction Center, NP7; and Tropical Prediction Center, NP8); Directors of the NDBC, NWSTC, and Chiefs of NRC, ROC and SR&DC facilities; or Meteorologist in Charge (MIC), Hydrologist in Charge (HIC), or Official in Charge (OIC).

13.3 Procedure

13.3.1 New facility Heating, Ventilation and Air Conditioning (HVAC) systems for NWS facilities shall be designed to comply with ASHRAE 62, "Ventilation for Acceptable Indoor Quality" and ASHRAE Standard 55, "Thermal Environmental Conditions for Human Occupancy." In particular, the volume of outside fresh air supplied to the workplace shall comply with the most recent version of ASHRAE 62.

13.3.2 Existing facility HVAC systems at NWS facilities shall comply with ASHRAE 62 to the maximum extent feasible.

13.3.3 Facilities personnel shall perform periodic checks on HVAC system performance. These checks should coincide with the facility's established preventative maintenance schedule. A semi-annual schedule is recommended. The system shall be checked for

compliance with ASHRAE standards including the following parameters: temperature and relative humidity within the work areas, carbon dioxide levels within the work areas, amount of fresh outside makeup air being introduced into the work areas and buildup of moisture within the HVAC duct system. Carbon dioxide levels are an indicator of whether adequate fresh outside makeup air is being introduced into the workplace. Concentrations above 1,000 parts per million are generally indicators of inadequate fresh air. It should be noted that carbon dioxide itself is not harmful at this concentration.

13.3.4 Any areas where microbial growth is noted shall be properly sanitized, particularly in areas where spores and mold may be introduced into the workplace air. A relative humidity between 30 and 60 percent is generally recommended to minimize microbial growth. All drip pans located in ductwork should have gravity drains. Care shall be taken to ensure that condensate does not accumulate in ductwork and that drains are kept clean.

13.3.5 HVAC systems shall be designed so that air is properly distributed throughout the workplace. During design or remodeling of office spaces, care shall be given to the correct placement of supply and return air ducts and diffusers. Office partitions shall be located in positions which will not disrupt correct airflow.

13.3.6 HVAC air intakes shall be located within a facility to minimize intake of contaminants from parking lots, exhaust stacks, adjacent highways or other sources of contaminants.

13.3.7 HVAC systems shall be maintained per manufacturer's recommendations, including periodic inspection and changing of filters. Adequate stock of filters shall be maintained, as required.

13.3.8 The Station Manager shall contact the NOAA Regional Safety Manager to obtain assistance in evaluating and addressing employees complaints or concerns related to indoor air quality. The EPA document "Building Air Quality: A Guide for Building Owners and Facility Managers" provides guidelines for performing Indoor Air Quality investigations. Facility personnel may be incorporated into the investigation if warranted. The results of all investigations shall be documented and maintained along with corrective actions which were implemented.

13.3.9 No employee shall be exposed to any regulated contaminant in excess of OSHA permissible exposure limits or ACGIH threshold limit values. The table 13-1, "Common Indoor Air Contaminants", lists a few of the common contaminants found in the indoor environment. The exposure limits are listed in terms of milligrams per cubic meter (mg/m^3) or parts per million (ppm).

Table 13-1. COMMON INDOOR AIR CONTAMINANTS

CONTAMINANT	OSHA PEL, 8 HOUR TWA	ACGIH TLV, 8 HOUR TWA	OTHER GUIDELINES
Carbon Monoxide	50 ppm	25 ppm	11 ppm - World Health Organization
Formaldehyde	0.72 ppm	0.3 ppm	N/A
Total Particulate	15 mg/m^3	10 mg/m^3	75 ug/m^3 - EPA Ambient Air Standard
Total Respirable Particulate	5 mg/m^3	3 mg/m^3	N/A
Carbon Dioxide	5000 ppm	5000 ppm	1000 ppm - ASHRAE 62

13.3.10 ASHRAE recommends a temperature range of 73°-79° F in summer conditions and a range of 68°-73° F in winter to maximize thermal comfort in office environments.

13.3.11 Miscellaneous. The complexity of studying and measuring the quality of office environment arises from various factors including:

a. Office building floor plans are frequently changing to accommodate increasingly more employees and organization.

b. Office buildings frequently undergo building renovations such as installation of new carpet, modular office partitions and freestanding offices, and painting.

c. Many of the health symptoms appearing are vague and common both to the office and home environment.

d. In general, very little data on pollutant levels within office environments is available.

e. Guidelines or standards for permissible personal exposure limits to pollutants within office building are very limited.

f. Frequently odors associated with chemical contaminants are noticeable following a building's renovation or installation of new carpeting. Vapors from paints, adhesives, sealants, office furniture, carpeting, and vinyl wall coverings are the source of a variety of irritant compounds. Although there is often no immediate danger to employees' safety and health (unless an employee has a known allergic reaction), measures shall be taken to minimize the discomforts associated with the irritating vapors. Among the measures to be employed are:

(1) Schedule carpeting, painting and other renovation activities for the weekends or after regular hours, whenever possible.

(2) Ventilate the affected area as much as possible to diminish concentration of the chemicals in the air as well as odors associated with the vaporized chemicals.

(3) Inform personnel regarding upcoming renovation activities that may cause irritating vapors to occur. This measure will allow time to arrange a temporary move of individual(s) with known allergy problems to another work area.

13.4 Quality Control

13.4.1 Regional or Operating Unit Environmental/Safety Coordinators

a. Shall perform an annual assessment of the regional headquarters facilities or operating unit to monitor and promote compliance with the requirements of this procedure.

b. Shall perform assessments or designate personnel to perform assessments of all field offices to monitor and promote compliance with the requirements of this procedure every two years.

13.4.2 Station Manager

Shall review or delegate review, of this procedure on an annual basis to ensure that the facility is complying with its requirements. Confirmation of this review shall be forwarded to the Regional or Operating Unit Environmental/Safety Coordinator.

13.4.3 NWS Headquarters (NWSH)

a. The NWS Safety Office shall perform an annual assessment of the NWSH facilities to ensure that the facilities are in compliance with this procedure.

b. The NWSH Safety Office shall periodically perform an assessment of the regional headquarters and field offices to ensure compliance with this procedure. The frequency of these regional and field office assessments shall be determined by the NWSH Safety Office.

c. Requests for clarification concerning this procedure shall be directed to the NWSH Safety Office.

13.5 Responsibilities

13.5.1 Regional or Operating Unit Environmental/Safety Coordinators*

Shall monitor and coordinate to promote compliance with the requirements of this procedure for the regional headquarters, and field offices or operating units.

13.5.2 Station Manager*

Shall have oversight over the implementation of this procedure, and ensure that the requirements of this procedure are followed by individuals at the NWS facility.

13.5.3 Safety or Environmental/Safety Focal Point*

a. Shall ensure that any responsibilities delegated to them by the Station Manager are implemented in accordance with the requirements of this procedure.

b. Shall ensure that facilities personnel conduct periodic checks on the facility HVAC system to ensure its adequate performance.

c. Shall investigate employee(s) concerns related to indoor air quality and shall ensure that deficiencies are remediated.

13.5.4 Employees

a. Individual employees affected by this procedure are required to read, understand and comply with the requirements of this procedure.

b. Report unsafe or unhealthful conditions and practices to their supervisor or safety focal point.

NOTE: * - Reference WSOM Chapter A-45 for complete list of responsibilities.

13.6 References

Incorporated references. The following list of references is incorporated as a whole or in part into this procedure. These references can provide additional explanation or guidance for the implementation of this procedure

13.6.1 American Conference of Governmental Industrial Hygienists, TLVs and BEIs, Threshold Limit Values for Chemical Substances and Physical Agents, Biological Exposure Indices.

13.6.2 American Society of Heating, Refrigerating, and Air Conditioning Engineers Standard 55, latest edition, "Thermal Environmental Conditions for Human Occupancy."

13.6.3 American Society of Heating, Refrigerating, and Air Conditioning Engineers Standard 62, latest edition, "Ventilation for Adequate Indoor Air Quality."

13.6.4 U.S. Environmental Protection Agency, Building Air Quality: A Guide for Building Owners and Facility Managers

13.6.5 U.S. Department of Labor, Occupational Safety and Health Administration, 29 CFR 1910, Subpart Z, "Toxic and Hazardous Substances."

13.7 Attachments

None